UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/774,593	02/10/2004	Katsuhiko Nakata	1341.1183	9572

21171   7590   09/02/2008
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EXAMINER
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ART UNIT	PAPER NUMBER
3714	

MAIL DATE	DELIVERY MODE
09/02/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

	Application No.	Applicant(s)
	10/774,593	NAKATA ET AL.
Office Action Summary	Examiner	Art Unit	
	Matthew D. Hoel	3714	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS,
WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>05/27/2008</u>.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-19</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-19</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
          application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

2.   The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

    1.   Determining the scope and contents of the prior art.
    2.   Ascertaining the differences between the prior art and the claims at issue.
    3.   Resolving the level of ordinary skill in the pertinent art.
    4.   Considering objective evidence present in the application indicating
          obviousness or nonobviousness.

3.   Claims 1, 2, 9, 10, 14, 15, and 19 are rejected under 35 U.S.C. 103(a) as being

obvious over Rosenberg, et al. (U.S. pre-grant publication 2002/0021283 A1,

application 09/934,739) in view of Strumolo, et al. (U.S. patent 6,831,572 B2).

4.   As to Claims 1 and 19: '283 teaches an object interaction expression apparatus

for expressing interactions between plural objects that move by simulation in a virtual

space (Abst., Figs. 5a,b). '283 has an expression mode storing unit that stores in a

correlated form an interaction magnitude of an object and a corresponding expression

mode in which the interaction magnitude will be expressed (application program driving

force feedback, stored on computer platform, Para. 46 and 47; force feedback models,

Para. 15 and 16). '283 has an interaction magnitude unit that calculates interaction

magnitudes of objects that interact with each other (low-level force command generated

with sensor data, Fig. 3; forces between to interacting paddles, Figs. 8a-c, Para. 160

and 161). '282 has an expression controller that controls an expression of the

interaction magnitude of the objects that interact with each other based on the

expression mode stored corresponding to the interaction magnitude calculated (force

feedback and visual output provided, Para. 48). Regarding the new limitation of an

interaction magnitude providing unit that provides controlled expression of the

interaction magnitude of the objects of the user, the examiners believes this is

anticipated by '283. Figs. 6a-i, Para. 141 to 146, show forces modeling the interaction

between a paddle and a ball, which is an example of a collision. Figs. 7a-c, Para. 147,

simulates an obstruction force being a virtual wall and can simulate a solid,

impenetrable wall. For practicality and safety, the force is limited to prevent injury to the

user and damage to the equipment. Para. 15 discusses the force fed back being

proportional to the amount of deformation in a collision. Para. 43 and 44 discuss

sporting simulations that would involve collisions, such as tennis, badminton, racketball,

hockey, etc., all of which involve hitting a ball or a puck. Para. 82 discusses the amount

of force applied to the controls being determined by velocity and acceleration at the time

of collision. These passages are analogous to Fig. 2B of the applicants' specification

which describes a force in the form of a vibration which increases roughly proportionally

to the amount of deformation in a vibration. The fed-back forces of '283 are not

vibrating forces like those of applicants' Fig. 2B, but they are forces nonetheless, and

fairly anticipate the claimed limitations. Vibrating forces are not specified in the

independent claims. Regarding the new limitations of expressing modes corresponding

to before, during, and after the interaction of the objects, this is anticipated by '283.

'283 throughout teaches how the simulated force can be a simulated gravitational pull

(Para. 87, 109, 131, 141, 145, 153, Claim 59). Any time there are two bodies having

mass, they exert gravitational forces on each other, even if the bodies are very far apart

and the gravitational force is infinitesimal. $F = G \cdot m_1 \cdot m_2 / r^2$, where G is 6.67×10^{-11}

$N \cdot m^2 / kg^2$. Thus, in '283, the user will feel the interaction between two bodies before

they interact or collide because of the gravitational force, during the interaction which is

the collision, and after the interaction or collision as the two bodies move away from

each other. '283 also teaches using magnetic brakes as actuators, which could be used

to simulate magnetic interactions between objects (Para. 69), which would be similar to

a gravitational force because the force would be felt before, during, and after the

collision as with gravitational force; in this case actual magnetic actuators would be

used to simulate a fictitious magnetic force between two fictitious objects in the video

game. As newly claimed, the interactions would be simulated based on requests from a

user as the simulated actions are user controlled ('283, Abst.). '572, however, teaches

one of the expression modes including vibration (vibration in the form of sound which is

proportional to the risk of hitting another vehicle, more intense sound for shorter

distances, and vice-versa, 3:47-56; alternatively, the indication could be color in the

sense of the intensity of the light that is shone in response to the oncoming vehicle).

Such a system would be expressed before, during, and after collision in that the

intensity of the signal is based on the distance between the vehicles or the risk of a

collision. It would have been obvious to one of ordinary skill in the art at the time the

invention was made to have applied the expression mode of '572 to the system of '283.

'283 has a simulated race car embodiment (Paras. 82 to 84). Such an indication would

have had the advantage of making the simulation training more realistic by using an

indication actually used in motor vehicles to indicator to the player/trainee the likelihood

of collision with another vehicle by outputting a sound or light intensity inversely

proportional to the distance between the two vehicles.

5.   As to Claims 9 and 14: '283 teaches a method for expressing interactions

between plural objects that move by simulation in virtual space (Abst., Figs. 5a,b). '283

stores in a correlated form an interaction magnitude of an object and a corresponding

expression mode in which the interaction magnitude will be expressed (application

program driving force feedback, stored on computer platform, Para. 46 and 47; force

feedback models, Para. 15 and 16). '283 calculates interaction magnitudes of objects

that interact with each other (low-level force command generated with sensor data, Fig.

3; forces between to interacting paddles, Figs. 8a-c, Para. 160 and 161). '283 controls

an expression of the interaction magnitude of the objects that interact with each other

based on the expression mode stored corresponding to the interaction magnitude

calculated (force feedback and visual output provided, Para. 48). Regarding the new

limitation an interaction magnitude providing unit that provides controlled expression

of the interaction magnitude of the objects of the user, the examiners believes this is

anticipated by '283. Figs. 6a-i, Para. 141 to 146, show forces modeling the interaction

between a paddle and a ball, which is an example of a collision. Figs. 7a-c, Para. 147,

simulates an obstruction force being a virtual wall and can simulate a solid,

impenetrable wall. For practicality and safety, the force is limited to prevent injury to the

user and damage to the equipment. Para. 15 discusses the force fed back being

proportional to the amount of deformation in a collision. Para. 43 and 44 discuss

sporting simulations that would involve collisions, such as tennis, badminton, racketball,

hockey, etc., all of which involve hitting a ball or a puck. Para. 82 discusses the amount

of force applied to the controls being determined by velocity and acceleration at the time

of collision. These passages are analogous to Fig. 2B of the applicants' specification

which describes a force in the form of a vibration which increases roughly proportionally

to the amount of deformation in a vibration. The fed-back forces of '283 are not

vibrating forces like those of applicants' Fig. 2B, but they are forces nonetheless, and

fairly anticipate the claimed limitations. Vibrating forces are not specified in the

independent claims. These two claims are identical except that one is a method claim

and another is properly cited computer-executable instructions on a computer-readable

medium for carrying out the steps of the method. The new limitations of these claims

are addressed in the rejection of Claim 1.

6.   As to Claims 2, 10, and 15: The interaction magnitude calculating unit of '283

calculates the interaction magnitude from a distance between the objects (restoration

force of collision related to speed and distance traveled by objects, Para. 160).

7.   Claims 3, 4, 11, and 16 are rejected under 35 U.S.C. 103(a) as being

unpatentable over '283 and '572 in view of Tarr (U.S. patent 6,191,796 B1).

8.   As to Claims 3 and 4: The combination of '283 and '572 discloses all of the

elements of Claims 3 and 4, but lacks specificity as to the collisions being elastic

deformations of the objects or plastic deformations of the objects. '283 teaches the

interaction magnitude calculating unit that calculates the interaction from the distance

between the objects after a collision (restoration for of collision related to speed and

distance traveled by objects after collision, Para. 160). '796, however, teaches that the

interaction between objects may be a collision (Col. 2, Lines 1 to 24), and further

teaches that the interaction may be elastic or plastic (Col. 2, Lines 25 to 34). It would

be obvious to one of ordinary skill in the art to apply the elastic and plastic collisions of

'796 to the force feedback system of '283 and '572. '283 in Para. 151 describes a

restoring force felt by the user when he or she pushes into a virtual wall; this would be

amenable to simulation by the plastic representation of '796 used to model permanently

deformable surfaces (Col. 2, Lines 27 to 31). Para. 141 of '282 describes a restoring

force by a resilient, not rigidly solid, paddle interacting with a ball during a game; this

would be amenable to simulation by the elastic representation of '796 used to model

resilient compliant surfaces (Col. 2, Lines 31 to 34). The advantage of this combination

would be to enhance the realism of the simulation by allowing either type of real-world

collision to be accurately simulated.

9.   As to Claims 11 and 16: '283 teaches the interaction magnitude calculating unit

that calculates the interaction from the distance between the objects after a collision

(restoration for of collision related to speed and distance traveled by objects after

collision, Para. 160). '796 teaches that the interaction between objects may be a

collision (Col. 2, Lines 1 to 24), and further teaches that the interaction may be elastic or

plastic (Col. 2, Lines 25 to 34).

10.   Claims 5, 6, 12, and 17 are rejected under 35 U.S.C. 103(a) as being

unpatentable over '283 and '572 in view of Gagne, et al. (U.S. patent 5,731,819 A).

11.   As to Claim 5: The combination of '283 and '572 discloses all of the elements of

Claim 5, but lacks specificity as to calculating the interaction magnitude in terms of a

denting. '819, however, teaches calculating the interaction magnitude in terms of a

denting amount (deformation and maximum deformation set in response to motion to

simulate inertia, Abst.). It would be obvious to one of ordinary skill in the art to apply the

calculated denting amount of '819 to the force feedback system of '283 and '572. Figs.

6a-h of '283 simulate the interaction of a player's paddle with a ball (Para. 141 to 146);

this is displayed visually (Figs. 8a-c, Para. 156 to 158). '819 accurately visually depicts

flexing of a body in terms of a deformation quantity in response to simulated motion

(Col. 1, Line 65 to Col. 2, Line 63). The advantage of this combination would be to

accurately simulate the force feedback felt by the player synchronized with the visual

deformation cues visually seen by the player.

12.   As to Claims 6, 12, and 17: The correlated expression modes of '283

simultaneously show a visual expression mode and a tactile expression mode. Figs.

6a-h of '283 simulate the interaction of a player's paddle with a ball (Para. 141 to 146);

this is displayed visually (Figs. 8a-c, Para. 156 to 158). '819 accurately visually depicts

flexing of a body in terms of a deformation quantity in response to simulated motion

(Col. 1, Line 65 to Col. 2, Line 63).

13.   Claims 7, 8, 13, and 18 are rejected under 35 U.S.C. 103(a) as being

unpatentable over '283, '572, and '796 in view of Pryor (U.S. patent 5,982,352 A).

14.   As to Claim 7: The combination of '283, '572, and '796 discloses all of the

elements of Claim 7, but lacks specificity as to storing pre-collision and post-collision

interaction magnitudes expressed by changing colors and impact vibrations. '352,

however, teaches the expression mode storing unit storing pre-collision and post-

collision interaction magnitudes by correlating the interaction magnitudes with the

expression mode expressed by changing colors, and the interaction magnitudes during

collision by correlation the interaction magnitudes with a impact waveform. '352 is able

to capture and store pre-collision and post-collision magnitudes (Col. 3, Lines 55 to 13).

'352 uses cross polarization to visually capture stresses in the objects as the are

strained during impact, thus correlating the interaction magnitudes with the expression

mode expressed by changing colors, and correlated with an impact waveform (Col. 18,

Lines 48 to 64). '352 is able to capture events and display visual information and force

feedback coordinated to the impact event (Col. 4, Lines 4 to 44). It would be obvious to

one of ordinary skill in the art to apply the waveform storage and changing colors of '352

to the combination of '283, '572, and '796. Figs. 6a-h of '283 simulate the interaction of

a player's paddle with a ball (Para. 141 to 146); this is displayed visually (Figs. 8a-c,

Para. 156 to 158). The visual stress simulation would more accurately convey to the

player the stresses involved in the interaction between the ball and the paddle in Figs.

6a-h of '283. '352 teaches tactile feedback being added to the system (Col. 5, Lines 39

to 45). The advantage of this combination would be to more accurately and perceptibly

correlate the visual display and force feedback to the player by visually displaying the

stress placed on the object by the player's interaction.

15.   As to Claim 8: '352 teaches the objects being constituent elements of a product,

and the expression modes that express the interaction magnitude constitute modes

comprehensible by a designer of the product. '352 teaches tactile feedback being

added to the system (Col. 5, Lines 39 to 45). One of the primary embodiments of '352

is CAD (computer-aided design), in which a user is able to three-dimensionally visualize

and haptically interact with the product being designed (Fig. 3; Col. 12, Line 1 to Col.

13, Line 15; Col. 5, Lines 39 to 45).

16.   As to Claims 13 and 18: '352 teaches the expression mode storing unit storing

pre-collision and post-collision interaction magnitudes by correlating the interaction

magnitudes with the expression mode expressed by changing colors, and the

interaction magnitudes during collision by correlation the interaction magnitudes with a

impact waveform. '352 is able to capture and store pre-collision and post-collision

magnitudes (Col. 3, Lines 55 to 13). '352 uses cross polarization to visually capture

stresses in the objects as the are strained during impact, thus correlating the interaction

magnitudes with the expression mode expressed by changing colors, and correlated

with an impact waveform (Col. 18, Lines 48 to 64). '352 is able to capture events and

display visual information and force feedback coordinated to the impact event (Col. 4,

Lines 4 to 44).

Response to Arguments

17.   Applicant's arguments with respect to claims 1 to 18 have been considered but

are moot in view of the new ground(s) of rejection. '572, however, teaches one of the

expression modes including vibration (vibration in the form of sound which is

proportional to the risk of hitting another vehicle, more intense sound for shorter

distances, and vice-versa, 3:47-56; alternatively, the indication could be color in the

sense of the intensity of the light that is shone in response to the oncoming vehicle).

Such a system would be expressed before, during, and after collision in that the

intensity of the signal is based on the distance between the vehicles or the risk of a

collision. It would have been obvious to one of ordinary skill in the art at the time the

invention was made to have applied the expression mode of '572 to the system of '283.

'283 has a simulated race car embodiment (Paras. 82 to 84). Such an indication would

have had the advantage of making the simulation training more realistic by using an

indication actually used in motor vehicles to indicator to the player/trainee the likelihood

of collision with another vehicle by outputting a sound or light intensity inversely

proportional to the distance between the two vehicles. The examiner respectfully

disagrees with the applicants as to the claims' condition for allowance.

Conclusion

18.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Yamada in U.S. patent 7,126,460 B2 teaches a system similar to that of '572. Feyereisen, et al. in U.S. patent 7,375,678 B2 teach a heads-up-display in which objects are shown as semi-transparent based on their distance.

19.   Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

20.   A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

21.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew D. Hoel whose telephone number is (571) 272-5961. The examiner can normally be reached on Mon. to Fri., 8:00 A.M. to 4:30 P.M.

22.   If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Robert E. Pezzuto can be reached on (571) 272-6996. The fax phone

number for the organization where this application or proceeding is assigned is 571-

273-8300.

23.   Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Matthew D. Hoel   /Robert E. Pezzuto/
Patent Examiner   Supervisory Patent Examiner
AU 3714   Art Unit 3714

/M. D. H./
Examiner, Art Unit 3714